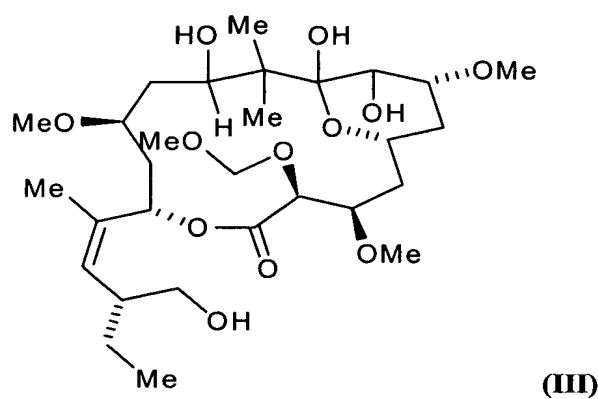


### AMENDMENTS TO THE CLAIMS

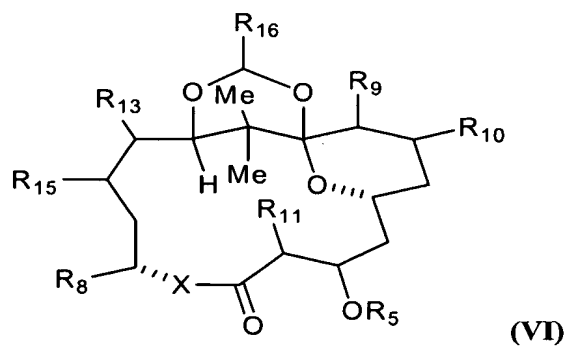
This listing of claims will replace all prior versions, and listings, of claims in the application.

#### Listing of Claims

1. (Cancelled).
2. (Cancelled).
3. (Original) A compound of formula:

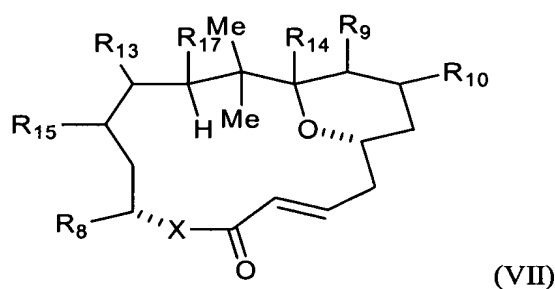


4. (Cancelled)
5. (Cancelled)
6. (Currently amended) A compound of formula:



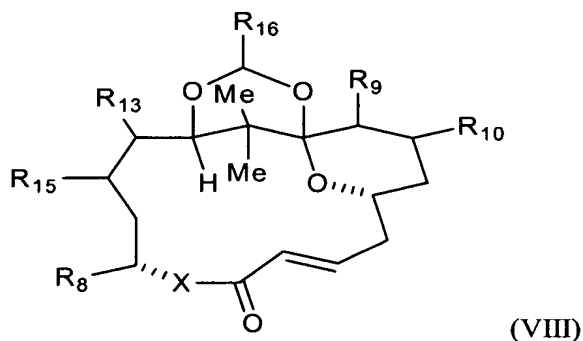
where  $R_{13}$  is H or Me, where  $R_9$ ,  $R_{10}$ ,  $R_{11}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R and  $R_5$  can be the same or different and are selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$ ,  $R_{16}$  can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, and where X is O or NH and wherein each functionalized group is substituted with the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

7. (Currently amended) A compound of formula:



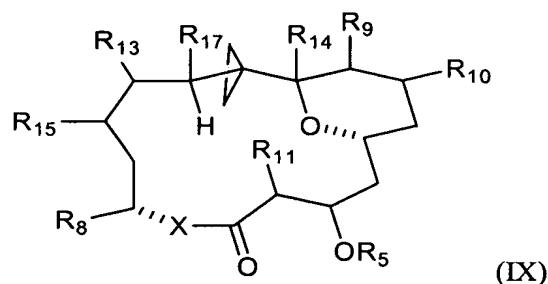
where  $R_{13}$  is H or Me, where  $R_{14}$ ,  $R_{17}$  can be the same or different and is selected from the group consisting of H, OH, or OR, where  $R_9$ ,  $R_{10}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$  is selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein each functionalized group is substituted with the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

8. (Currently amended) A compound of formula:



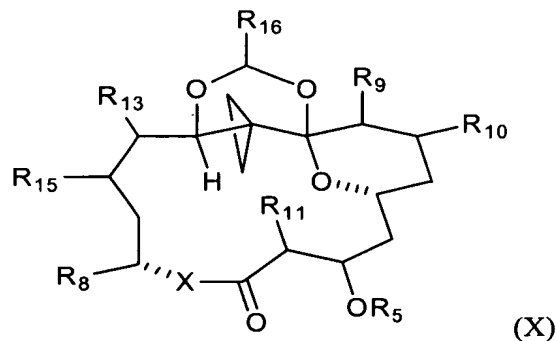
where  $R_{13}$  is H or Me, where  $R_9$ ,  $R_{10}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$ ,  $R_{16}$  can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein **each functionalized group is substituted with the functional group is a heteroatom**, a halide, an aryl, or a heteroaryl.

9. (Currently amended) A compound of formula:



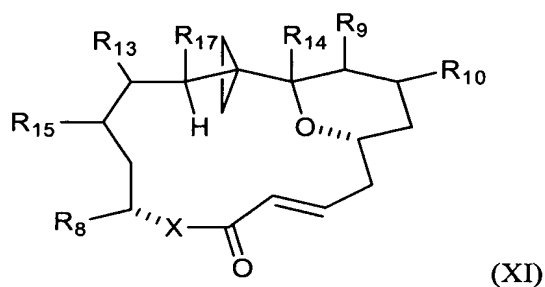
where  $R_{13}$  is H or Me, where  $R_{14}$ ,  $R_{17}$  can be the same or different and are selected from the group consisting of H, OH, or OR, where  $R_9$ ,  $R_{10}$ ,  $R_{11}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R and  $R_5$  can be the same or different and are selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$  is H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein **each functionalized group is substituted with the functional group is a heteroatom**, a halide, an aryl, or a heteroaryl.

10. (Currently amended) A compound of formula:



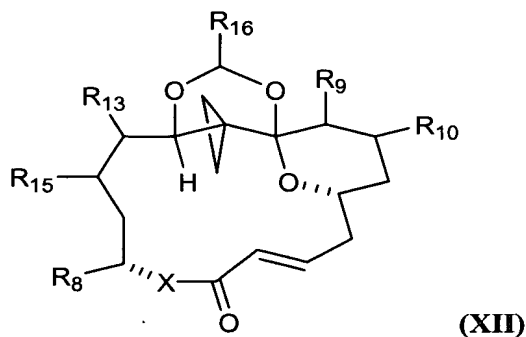
where  $R_{13}$  is H or Me, where  $R_9$ ,  $R_{10}$ ,  $R_{11}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R and  $R_5$  can be the same or different and are selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$ ,  $R_{16}$  can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein each functionalized group is substituted with the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

11. (Currently amended) A compound of formula:



where  $R_{13}$  is H or Me, where  $R_{14}$ ,  $R_{17}$  can be the same or different and are selected from the group consisting of H, OH, or OR, where  $R_9$ ,  $R_{10}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$  is H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein each functionalized group is substituted with the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

12. (Currently amended) A compound of formula:



where  $R_{13}$  is H or Me, where  $R_9$ ,  $R_{10}$ ,  $R_{15}$  can be the same or different and are selected from the group consisting of H, Me, OR, where R is selected from the group consisting of H, Me, alkyl, or functionalized alkyl, where  $R_8$ ,  $R_{16}$  can be the same or different and are selected from the group consisting of H, aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, where X is O or NH, and wherein each functionalized group is substituted with the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

13. (Cancelled)

14. (Withdrawn) A method for treating cancer within a subject comprising administering to the subject a therapeutically effective amount of a compound of any one of claims 3 and 6-12, wherein the cancer is selected from breast cancer, brain cancer, lung cancer, liver cancer, spleen cancer, renal cancer, lymph node cancer, intestinal cancer, blood cancer, pancreatic cancer, colon cancer, stomach cancer, endometrium cancer, prostate cancer, testicular cancer, ovarian cancer, skin cancer, esophageal cancer, and bone marrow cancer.

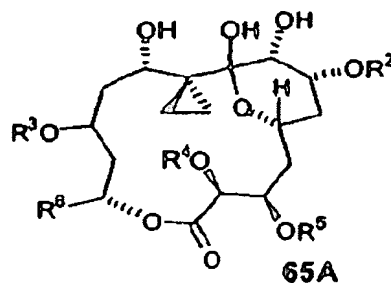
15. (Cancelled).

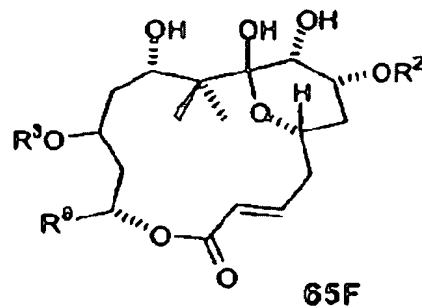
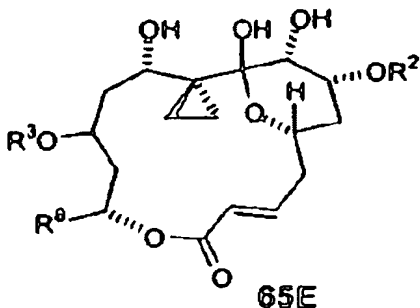
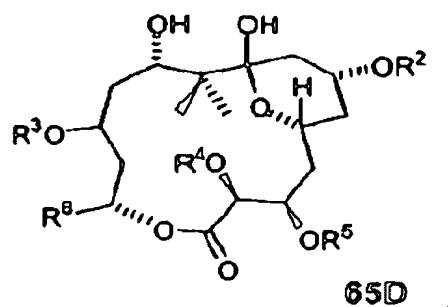
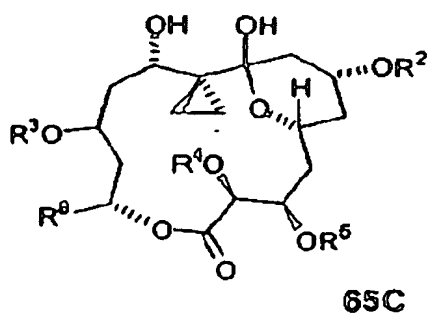
16. (Cancelled).

17. (Withdrawn) A method of stabilizing microtubule formation in a cell comprising administering to the cell the compound of any one of claims 3 and 6-12 for a period of time and in an amount sufficient to stabilize microtubule formation.

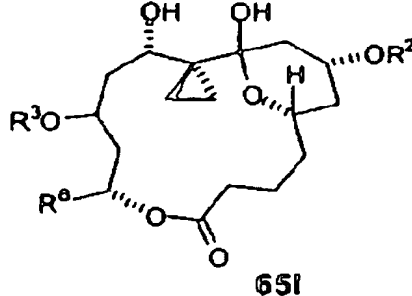
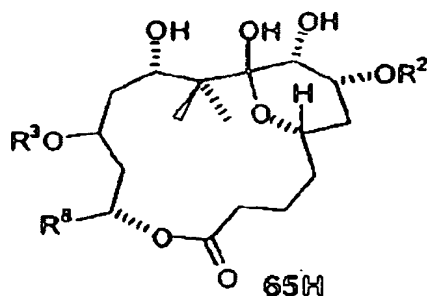
18.-22. (Canceled)

23. (Currently amended) A compound selected from the group consisting of:

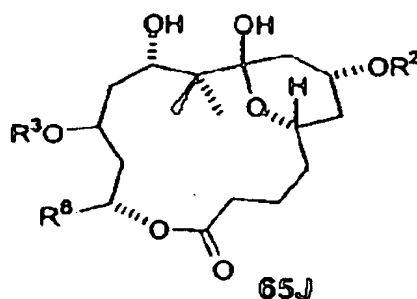




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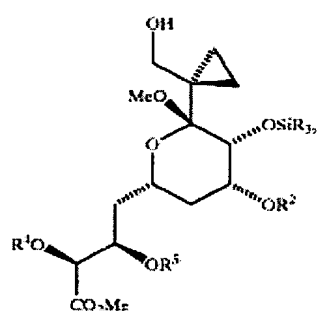
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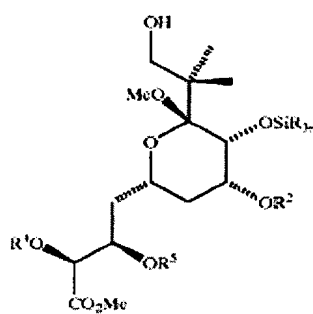


wherein  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and where  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein each functionalized group is substituted with the functional group-is-a-heteroatom, a halide, an aryl, or a heteroaryl.

24. (Withdrawn) A method of producing a macrolactone, comprising:

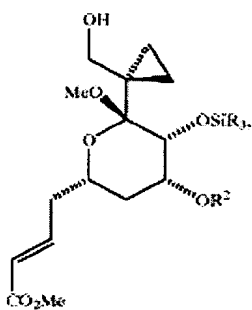
(a) oxidizing an alcohol function in a compounds selected from the group consisting of:





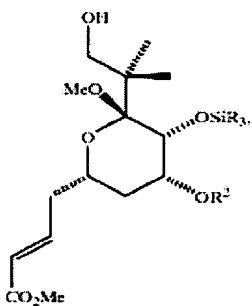
61B

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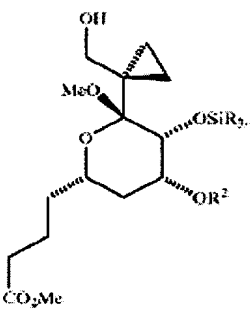
61E

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61F

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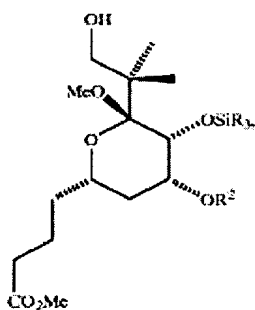


61G

, and



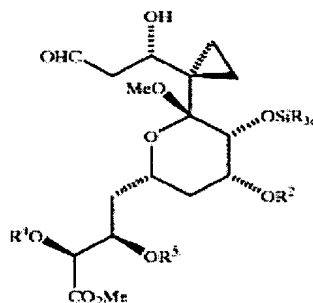
61H



wherein  $R^2$ ,  $R^4$  and  $R^5$  are the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl, to obtain a compound having an aldehyde function;

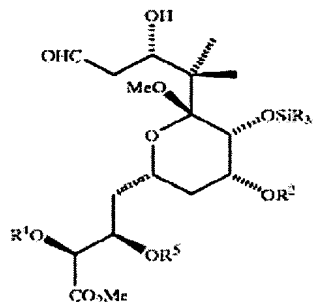
- (b) reacting the compound obtained in (a) with an allylating agent;
- (c) subjecting the reaction product of (b) to oxidative cleavage of the aldehyde to obtain a compound selected from the group consisting of:

62A

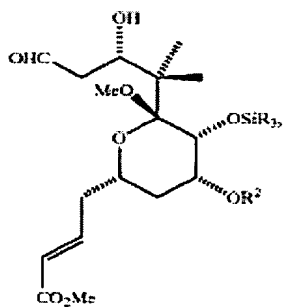
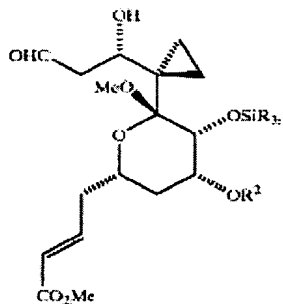
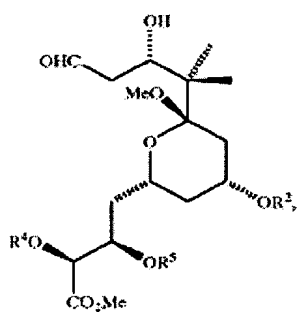
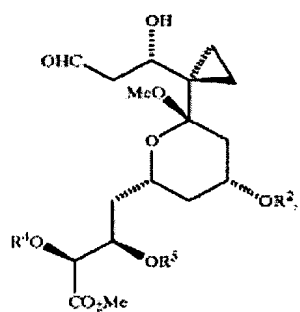


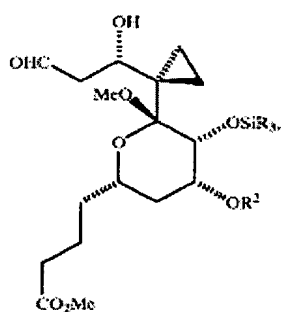
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62B

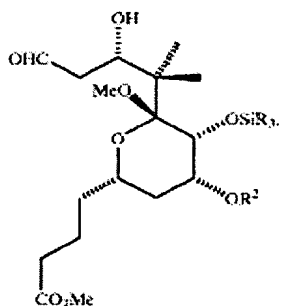


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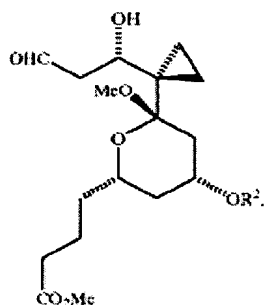




62G

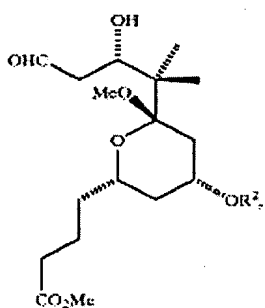


62H



62I

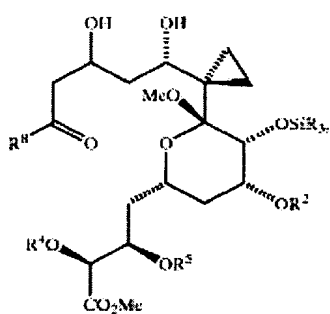
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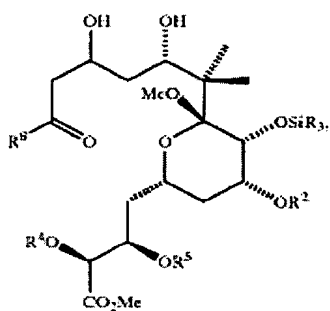
62J

wherein  $R^2$ ,  $R^4$  and  $R^5$  are the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl;

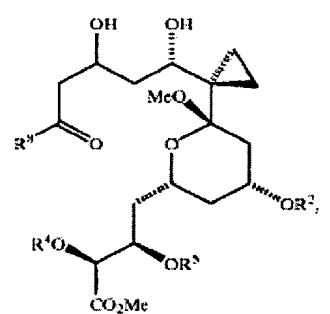
(d) reacting the compound obtained in (c) with an enolate derived from a methyl or ethyl ketone to obtain a compound selected from the group consisting of:



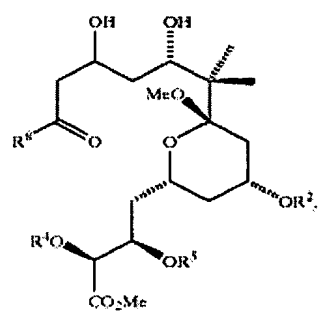
63A



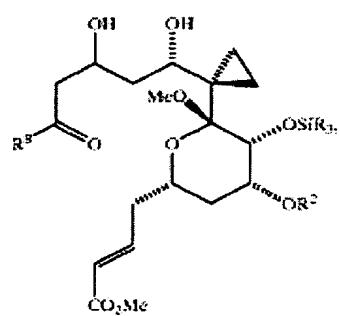
63B



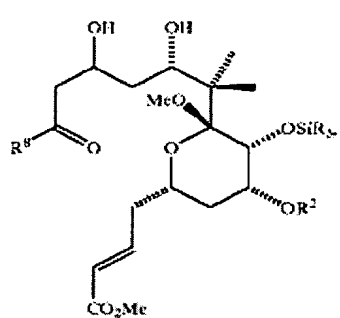
63C



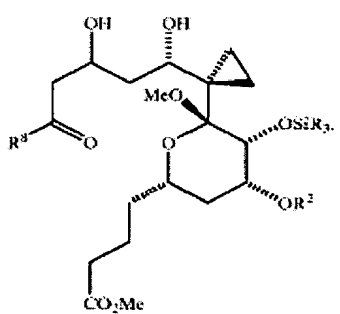
63D



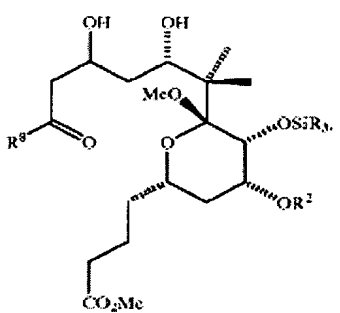
63E



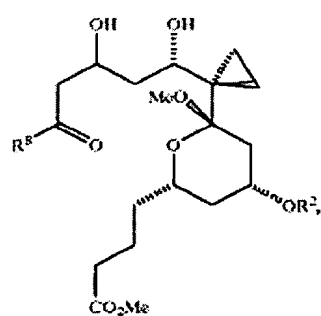
63F



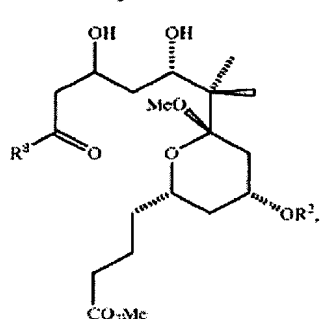
63G



63H

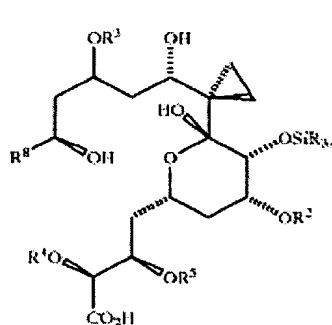


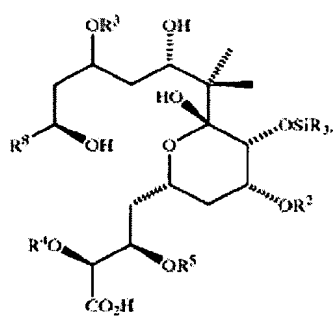
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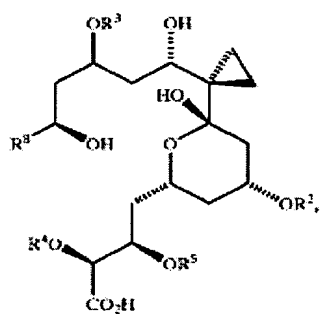
wherein  $R^2$ ,  $R^4$  and  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl;

- (e) reacting the compound obtained in (d) with an alkylating agent to introduce an  $R^3$  group;
- (f) subjecting the compound obtained in (e) with a reducing agent to reduce the ketone group in the compound obtained in (e) to an alcohol;
- (g) converting the alcohol group of the compound obtained in (f) to an ester group;
- (h) subjecting the compound obtained in (g) to an agent that hydrolyzes the ester group of the compound produced in (f) to a carboxylic acid group to obtain a seco-acid compound selected from the group consisting of:

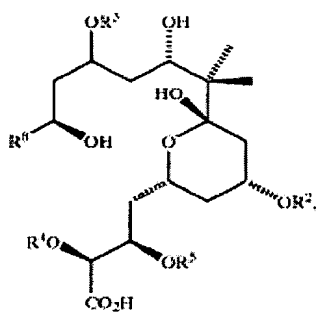




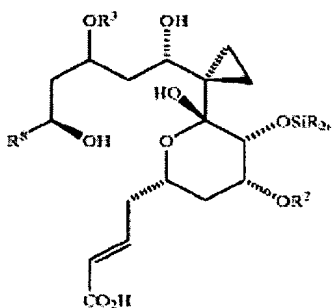
64B



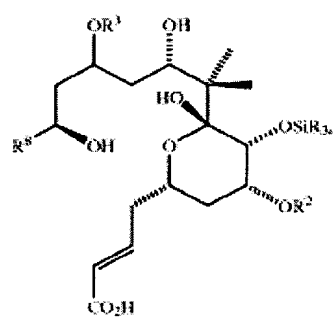
64C



64D

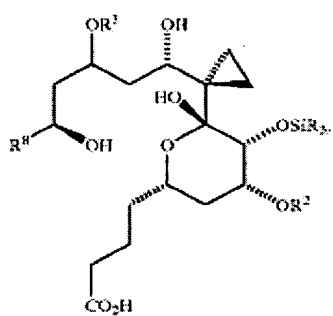


64E



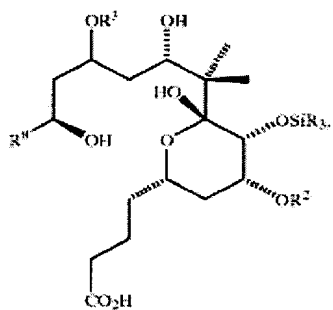
64F

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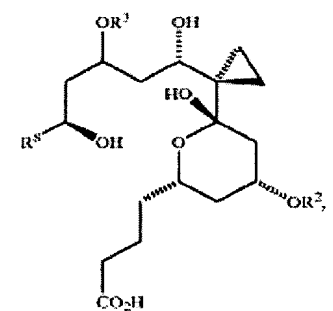
64G

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64H

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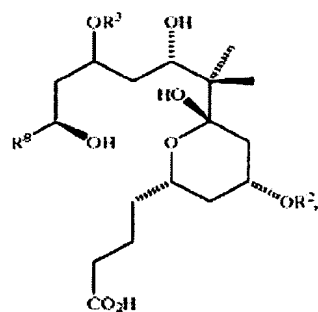


64I

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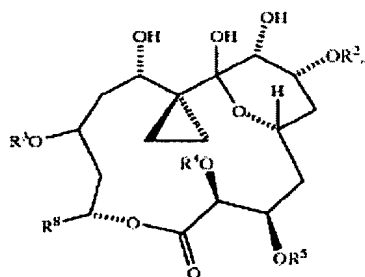
64I



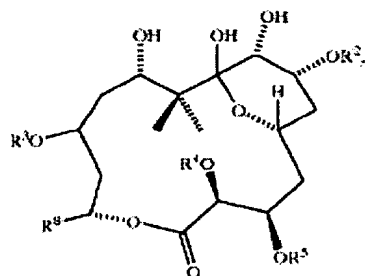
wherein  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and where  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl; and

(i) reacting the carboxylic acid group and a hydroxyl group of the compound produced in (h) to obtain a macrolactone selected from the group consisting of:

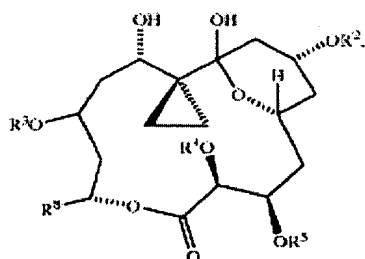
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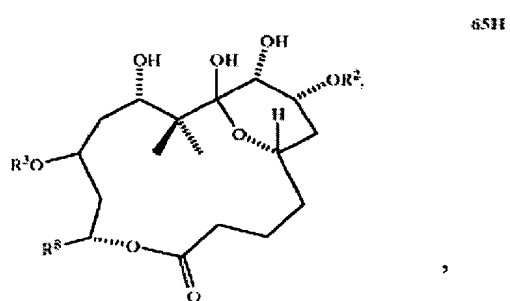
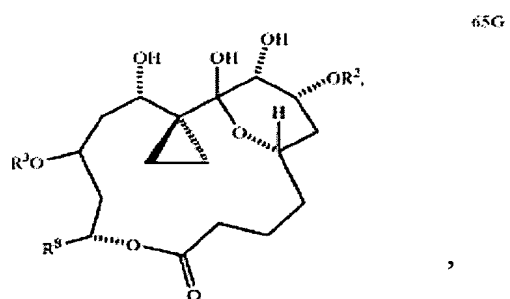
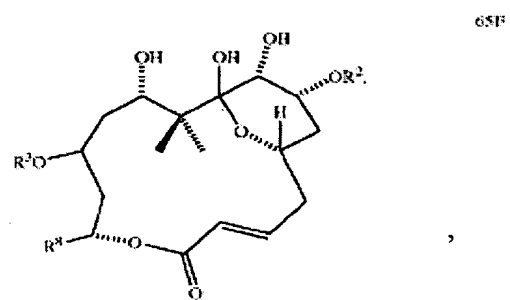
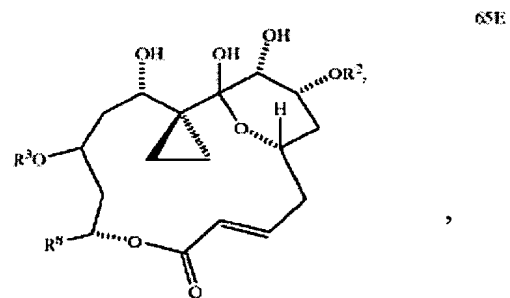
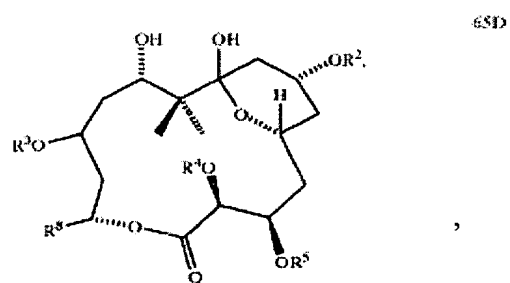


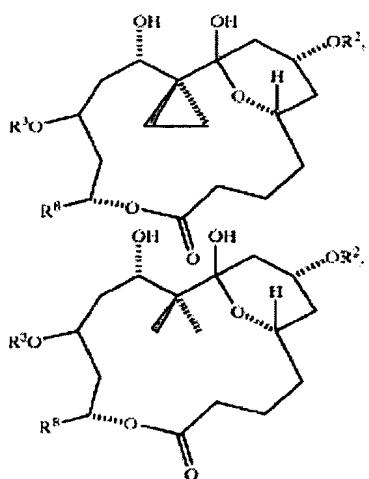
65B



65C







65I

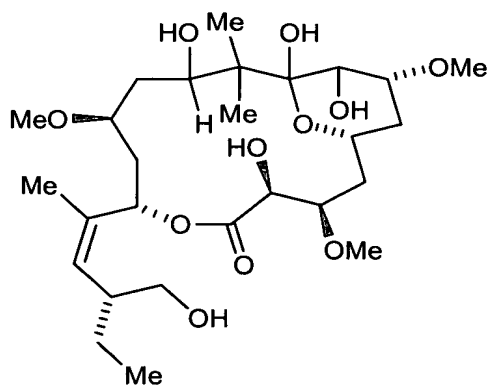
, and

65J

wherein  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  can be the same or different and are selected from the group consisting of alkyl, and functionalized alkyl, and where  $R^8$  is selected from the group consisting of aryl, heteroaryl, alkyl, functionalized alkyl, alkenyl, functionalized alkenyl, alkynyl, and functionalized alkynyl, wherein the functional group is a heteroatom, a halide, an aryl, or a heteroaryl.

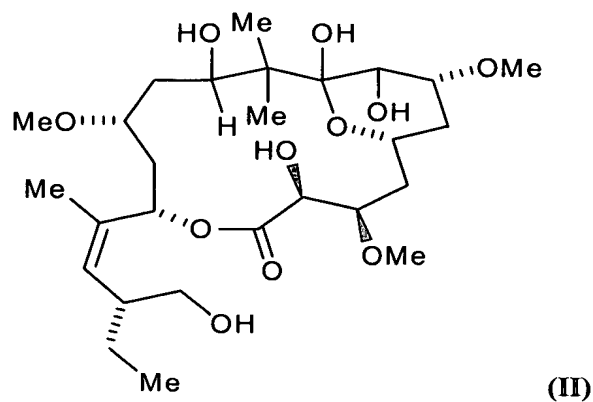
25. (Cancelled).

26. (Withdrawn) The method of claim 24 wherein the macrolactone is Peloruside A:

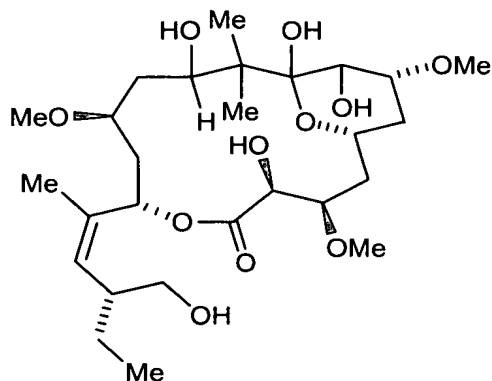


(I)

27. (Withdrawn) The method of claim 24 wherein the macrolactone has the formula:



28. (Withdrawn) A method of stabilizing microtubule formation in a cell comprising administering to the cell a pharmaceutical composition comprising a therapeutically effective amount of a compound of formula:



for a period of time and in an amount sufficient to stabilize microtubule formation.